Monthly Meeting
Richards Medal Award Meeting at Harvard

Richards Medal Address
By Gabor A. Somorjai

2016 Process Chemistry Symposium
A report by Luigi Anzalone, Steve Canham, Katherine Lee, Steve Mennen and Xianglin Shi

January Monthly Meeting
A report by Carol Mulrooney and Catherine Rawlins
Hot Science at the 2016 NESACS Process Chemistry Symposium

By Luigi Anzalone, Steve Canham, Katherine Lee, Steve Mennen and Xianglin Shi

Over 180 people convened for a diverse scientific program focused on process chemistry at the annual NESACS Process Chemistry Symposium, held at the Novartis Institutes for BioMedical Research in Cambridge, MA on October 20, 2016.

The symposium showcased eight speakers, who represented academic institutions from across the United States, and biotech and pharmaceutical companies from the local scientific community: Matthew Beaver, Amgen, Inc.; Richard Braatz, MIT; Abigail Doyle, Princeton University; Eric Jacobsen, Harvard University; Albert Kwok, Biogen; Kian Tan, Novartis Institutes for BioMedical Research; Pete Ruggiero, Vertex Pharmaceuticals Incorporated; and Jin-Quan Yu, The Scripps Research Institute.

The program included lectures by academic speakers on cutting-edge organic synthesis methodology, catalysis, and slug-flow crystallization; and featured real-life examples from captivating speakers from industry on topics including process development, flow technology, crystallization-induced dynamic resolution, and C-H activation. The event drew attendees from over 40 companies and academic institutions.

In addition to delivering a powerful scientific program, the day-long symposium fostered many opportunities for attendees to interact with each other and for the representatives from symposium sponsor companies to connect with potential clients over breakfast, lunch and coffee breaks, as well as at a lively networking reception at the close of the day.

The symposium committee would like to thank Novartis for hosting the symposium, and dedicated individuals including Anna Singer, Jim Piper, Ken Drew, Rebecca Johnson, Allie Roper, Karen Briner, Scott Plummer, Pete Delgado, Angie Angeles, Michael Humora, Adam Looker, Don Walker, and Elaine Lee for helping to make the symposium a success.

We are pleased to note that the 2015 NESACS Process Symposium garnered a 2016 ACS ChemLuminary Award for Best Industry Event.

Mark your calendars – October 12, 2017 – for the 2017 NESACS Process Chemistry Symposium, to be held at Amgen, Inc., Cambridge, MA. Confirmed speakers include Stephen Buchwald, MIT; Sarah Reisman, California Institute of Technology; Richmond Sarpong, University of California at Berkeley; and Corinna Schindler, University of Michigan.

What’s Yours?
Many local employers post positions on the NESACS job board.
Find yours at www.nesacs.org/jobs

Above, from left to right: Kian Tan, Kathy Lee, Jin-Quan Yu, Eric Jacobsen, Abigail Doyle, Steve Canham, Steve Mennen and Angie Angeles

L-R: Dominique Hebraults, Richard Braatz and Steve Mennen

L-R: Olga Gocharova and Luigi Anzalone

L-R: Suzie Opalka, Erwin Irdam and Bin Ma

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Cover: Professor Gabor A. Somorjai, 2016 Richards Medal Recipient (Photo courtesy of Professor Somorjai).

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Summer-September 2017 Issue: July 15, 2017

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January Monthly Meeting

By Carol Mulrooney and Catherine Rawlins

The first NESACS meeting of 2017 with ACS President Allison Campbell had several notable events.

The day started at noon with a lunch at Catalyst restaurant in Cambridge, sponsored by the WCC. Here a diverse group of women chemists at varying stages of their careers met with Allison, shared their backgrounds, and connected in a small, informal setting with many vibrant discussions.

Chemists shared their experiences addressing issues such as work-life balance and finding new career opportunities. One important lesson the attendees learned from Allison is if you have a pet snake, don’t mention it to her! (She does not like snakes at all, not a surprise for someone who lives in rattlesnake country.)

The WCC is looking forward to hosting more of these lunches at future NESACS monthly meetings and enabling more women chemists to interact with NESACS guest speakers.

Following lunch, lead members of the Younger Chemists Committee and the Government Affairs Committee reconvened at the Broad Institute for a joint meeting with Allison. There, Allison was able to touch on her three main foci for her term as President with one being an emphasis on scientists interacting with Congress.

Since the goals and members of these committees were in line with each other, much was discussed on how to attract more young chemists to focus on science policy.

The Younger Chemists were able to share details about their leadership structure, organization, and successful events and initiatives. The Government Affairs Committee was able to give feedback about how ACS can improve their policy and advocacy webpage and make it more accessible to members. Allison’s goal is to provide a start-up kit for members to better prepare for congressional visits and to engage the ACS community in science policy. Allison was very receptive to new ideas and it made for a fruitful and productive discussion.

After this meeting, Allison was given a tour of the automation and chemistry labs of the Broad Institute. The day was completed by a reception, dinner, and then Allison’s presentation titled “ACS Presidential Focus: Initiatives and Symposia for 2017”.

Highlights of the talk included previews of the Presidential Symposia, some to be held at the April 2017 National Meeting and some in Washington DC. There will be new workshops developed to promote outreach, helping ACS leaders speak effectively to Congress and the public. A safety summit will bring together Presidents and Directors of international chemical societies building common principles and practices.

Allison also shared her career path and insights into helping young chemists achieve their goals. One of the major challenges scientists face as they advance in their careers is work-life balance. With this challenge, there were five insights that worked for her: being selfish with family time, mixing priorities (Allison did this by combining her love of biking with her morning commute), saying “no” but offering alternatives when asked to do extra work (for example helping find someone who would be able to do the work and offering help in the future), asking for help when needed, communicating expectations (especially with family when planning a busy work schedule) and finally, compromise. These insights were well received and the audience had many questions and observations to share.

At the end of the day, Allison expressed her pleasure at being able to meet so many members of NESACS and was very impressed by their enthusiasm and engagement, especially from our younger chemists!
Monthly Meeting
The 968th Meeting of the Northeastern Section of the American Chemical Society
2016 Richards Medal Award Meeting
Thursday, March 23, 2017
Harvard University
Cambridge, MA

5:30 pm Social Hour (Loeb House)
6:15 pm Dinner (Loeb House)
8:15 pm Richards Medal Award Ceremony
Mallinckrodt Building, Pfizer Lecture Hall - MB23, 12 Oxford Street, Cambridge, MA.
Leland L. Johnson Jr., NESACS Chair, Presiding
Reflections on Theodore William Richards
Introduction of the 41st Richards Medalist
2016 Richards Medalist
Professor Gabor A. Somorjai, Department of Chemistry, University of California, Berkeley and Lawrence Berkeley National Laboratory
Address: The Surface Science Approach to Molecular Catalysis. Transition from Studies of Crystal Surfaces in Vacuum to High Pressure and Liquid Phase Heterogeneous, Homogeneous and Enzyme Nanoparticle Catalysis

YOU MUST REGISTER IN ADVANCE TO ATTEND THE MEETING: DINNER RESERVATIONS ARE REQUIRED.
THE PUBLIC IS INVITED

- For those who would like to join us for dinner, register by noon, Thursday, March 16, using Eventbrite.
- To register, please use the link at: http://www.nesacs.eventbrite.com/
- Cost: Members, $30; Non-members, $35; Retirees, $20; Students, $10. Dinner reservations not cancelled at least 24 hours in advance must be paid.
- If you wish to join us for this meeting and not eat dinner, please register by noon, Thursday, March 17, using the Eventbrite link above.
- New members or those seeking additional information, contact the NESACS administrative coordinator, Anna Singer, at secretary@nesacs.org or at (781) 272-1966 during regular business hours only.
- Please note: the office is open on a part-time basis only

Anyone who needs special services or transportation, please call Anna Singer a few days in advance so that suitable arrangements can be made. Free parking in the Broadway St. Garage (3rd level or higher), enter from Cambridge Street via Felton, St.

Abstract:
The surface science of chemical reactivity utilized single crystal surfaces to determine the atomic structures at interfaces responsible for rearrangements of molecules through changes at covalent or charge transfer (acid-base) bonds. The evolution of nanomaterials science has had a large impact on molecular catalysis science since most heterogeneous, homogeneous and enzyme catalysts are nanoparticles in the 0.8-10 nm range. Monometallic and bimetallic nanoparticles as well as core-shell structures and oxide-metal interfaces are used to study multipath catalytic reactions with high product selectivity. At the same time instruments were developed that can be employed to study catalysts under reaction conditions to monitor dynamic changes that occur during catalytic reactions, their atomic and molecular structure, and composition and oxidation state with high spatial and time resolution. These in-situ surface

Biography:

Gabor A. Somorjai was born in Budapest, Hungary, on May 4, 1935. He was a fourth year student of Chemical Engineering at the Technical University in Budapest in 1956 at the outbreak of the Hungarian Revolution. He left Hungary and immigrated to the United States, where he received his Ph.D. degree in Chemistry from the University of California, Berkeley in 1960. He became a U.S. citizen in 1962.

After graduation, he joined the IBM research staff in Yorktown Heights, New York, where he remained until 1964. At that time, he was appointed Assistant Professor of Chemistry at the University of California, Berkeley. In 1967, he was named Associate Professor, and in 1972 promoted to Professor. Concurrent with his faculty appointment, he is also a Faculty Senior Scientist in the Materials Sciences Division, and Director of the Surface Science and Catalysis Program at the Center for Advanced Materials, at the Lawrence Berkeley National Labo

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Richards Award Address

Molecular Catalysis Science. The Development of Surface Science toward Integration of Heterogeneous, Homogeneous, and Enzyme Catalysis on the Nanoscale

Gabor A. Somorjai
University of California, Berkeley, and Lawrence Berkeley National Laboratory, Berkeley, California 94720

My adventure into this field followed the transformation from investigating single crystal surfaces in vacuum and high pressures and at the liquid phase, to the development of the molecular science in all three fields of catalysis, heterogeneous, homogeneous and enzyme that I am attempting to integrate. Much of the surface science of catalysis started with metal single crystals, mostly platinum, which was the granddaddy of all catalysts, discovered in the beginning of the 19th Century. Low energy electron diffraction showed different types of single crystal surfaces of platinum; e.g., hexagonal, square, or stepped crystal surfaces with periodic steps and kinks. Molecular beam scattering in the 1970s discovered that stepped surfaces can perform $\text{H}_2/\text{D}_2$ exchange with high probability. On the other hand, the defect-free flat surfaces do not break H-H bonds, where such bond breaking is below the detection limit. More studies of bond breaking revealed not only H-H chemical bonds but also C-H, O-O, C-0, and that C-C bonds can be broken at these low coordination sites at steps and kinks of surfaces.

Making a big jump in chemistry to nanoparticles, it was found that most catalysts are in nanoparticle dimensions.

Metal Nanoparticles and Mesoporous Oxide Synthesis

Colloidal synthesis of nanoparticles starting with ionic salts, surfactant solvents, and reducing agents can produce nanoparticles from 1-10 nm in size. Oxide supports for the transition metal nanoparticles are frequently utilized. The mesoporous inorganic oxide shells enable high temperature catalytic oxidation studies.

Metal Nanoparticles’ Size Dependent Covalent Bond Catalysis

Metal nanoparticles in the size range of 1 to 10 nm are produced with very well-defined size control. The size and shape of metal nanoparticles affect most catalytic reaction rates and selectivities. Most reactions, including the hydrogenation reactions of benzene, cyclohexene, crotonaldehyde, pyrrole, pyrene, and furfural, are multi-path. It was found that the turnover rates and selectivities are size and shape dependent. For example, CO hydrogenation, commonly called Fischer-Tropsch synthesis, shows a 5-fold increase in turnover rates as the cobalt catalyst nanoparticle size changes from 3 to 11 nanometers. Methylocyclopentane isomerization shows size and shape dependence of the nanoparticles. The question that naturally arises is “why are the catalytic selectivity and turnover rates of metal nanoparticles size and shape sensitive?”

Atomic Level Characterization under Reaction Conditions

In-situ surface techniques, mostly practiced using the synchrotron, can be used to identify the size and shape dependence of reaction rates and selectivities of catalytic reactions. Sum frequency generation vibrational spectroscopy, high pressure scanning tunneling microscopy, and synchrotron techniques, including ambient pressure X-Ray Photoelectron Spectroscopy (APXPS), extended X-ray absorption fine structure, and Infrared and X-ray microspectroscopy, reveal how the size and shape of catalysts control reaction rates and selectivities. Many bimetallic nanoparticles with various sizes and shapes show that a composition change is driven by a change in chemical and oxidizing environments of these nanoparticles. High pressure scanning tunneling microscopy shows the adsorbate mobility under reaction conditions. The adsorbates restructure the metal surfaces, and this is enhanced at high reactant pressures.

Changing the Oxidation States of Nanoparticles with Decreasing Size — Conversion of Homogeneous to Heterogeneous Catalysis

As the sizes of nanoparticles change from 2 nm toward 0.8 nm, the electronic structure and oxidation states of these nanoparticles change as well, as indicated by XPS studies. Rhodium or platinum nanoparticles change their oxidation states from metallic to oxide rhodium 3+ or platinum 2+ and 4+ as the nanoparticle size is changed. Calculations by Norskov et al clearly indicate that when oxygen is adsorbed on gold or platinum nanoparticles, the oxygen removes electrons from the metal nanoclusters, which then become oxides. When the small transition metal nanoparticles are encapsulated by dendrimers, the high oxidation state is maintained and these nanoparticles can carry out homogeneous catalytic reactions as shown in many examples by Toste and Somorjai. Dendrimer-encapsulated nanoparticles with very small size carry out electrophilic reactions (e.g. hydroformylation and decarbonylation) in a solution phase, similar to transition metal ions. Transition metal nanoclusters can carry out single metal ion-like catalytic reactions.

Oxide-Metal Interfaces as Active Sites for Acid-Base Catalysis: Crotonaldehyde Hydrogenation as an Example

When platinum is supported on SiO$_2$ or titanium oxide mesoporous support, the product distribution of crotonaldehyde hydrogenation dramatically changes. On titanium oxide many products from crotonaldehyde, including butanol, croton alcohol, butyl aldehyde, and propylene are formed; while on platinum supported in SiO$_2$ the only product is butyl aldehyde. This process, which changes the product distribution by changing the support, which alone does not carry out reactions, changes the catalytic activity of group VIII transition metals of iron, nickel, rhodium, palladium,

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dium, and iridium. The supports that change the catalytic activity are titanium oxide, cerium oxide, and niobium oxide. This phenomenon, frequently called SMI or strong metal support interaction, is related to the electron flow between the transition metal and the oxide support under reaction conditions.\(^{15}\)

The fundamental reasons for this process have been studied, and it is caused by the electron flow between the transition metal and the oxide support. It is also called “hot electron flow.” The electrons in the transition metal are excited when an exothermic catalytic reaction or photons produce an electron flow, which is observed by carbon monoxide oxidation or hydrogen oxidation reactions.\(^{16}\) When an oxide metal interface is constructed, often called a Schottky barrier, with a metal layer of a nanometer-range thickness on a transition metal oxide surface, the electrons flow from the metal to the oxide. The electron flow ionizes the reacting molecules. In the case of CO oxidation CO\(_2\) forms, and in the case of hydrogen oxidation H\(_2\)O forms.\(^{17}\) These are the electrons that can be detected by applying the potential between the metal and the oxide interface. These electron flows between an oxide and a metal interface ionizes molecules and they are commonly called acid-base catalysis phenomena. When the platinum is supported by various oxides, ranging from silica to zirconium oxide, the isomerization activity of n-hexane is controlled by the oxide metal interface charge flow.

**Hybrid Systems. Hybridized Enzymes to Immobilize onto Glass**

Enzymes are able to maintain remarkably high selectivity towards their substrates while still retaining high catalytic rates. By immobilizing enzymes onto surfaces we can heterogenize these biological catalysts, making it practical to study, use, and combine them in an easily controlled system. We have developed a platform that allows for the simple and oriented immobilization of proteins through DNA directed immobilization (DDI).\(^{18}\) We use DDI to deposit enzymes onto glass slides. This is done through bottom-up assembly of two separate components. The first is coupling an aldolase DNA to aniline functionalized glass slides. In tandem, aldolase is modified at the N-terminus with a complimentary DNA strand, also substituted with the aminophenol coupling partner. The subsequent hybridization of the surface oligomer with the complementary oligomer-protein conjugate results in the oriented display of aldolase on the glass surface.\(^{18}\) Taking advantage of the transparent nature of the glass surfaces used in these studies, we are also seeking to characterize these surfaces using alternative spectroscopic techniques, such as sum frequency generation and X-ray photoelectron spectroscopy, to gain information about the orientation and coverage or the protein. Similar studies are carried out by adsorbing on glass surfaces dehydrogenase enzymes that oxidize alcohol to aldehydes and aldehydes to acids, respectively.

**Integration of the Three Fields of Catalysis (Heterogeneous, Homogeneous and Enzyme) — Future Promise**

In our attempt to focus on the chemical correlations between the three groups (heterogeneous, homogeneous and enzymatic) the future looks very promising for molecular catalysis science studies. Catalysis of heterogeneous, homogeneous and enzymatic origin alike involve nano-sized materials. These nanocatalysts comprise organic and inorganic components. Charge, coordination, interatomic distance, bonding, and orientation of catalytically active atoms are molecular factors shared by all three fields of catalysis. By controlling the governing catalytic components and the...
Announcements

The Norris-Richards Undergraduate Summer Research Scholarships
March 24, 2017 Deadline

The Northeastern Section of the American Chemical Society established the James Flack Norris and Theodore William Richards Undergraduate Summer Scholarships to honor the memories of Professors Norris and Richards by promoting research interactions between undergraduate students and faculty.

Research awards of $3500 will be given for the summer of 2017. The student stipend is $3000 for a minimum commitment of ten weeks of full-time research work. The remaining $500 of the award can be spent on supplies, travel, and other items relevant to the project.

Institutions whose student/faculty team receives a Norris/Richards Undergraduate Summer Research Scholarship are expected to contribute toward the support of the faculty members and to waive any student fees for summer research. Academic credit may be granted to the students at the discretion of the institutions.

Award winners are required to submit a report (~5-7 double-spaced pages including figures, tables, and bibliography) of their summer projects to the NESACS Education Committee by October 20, 2017 for publication in The Nucleus. They are also required to participate in the Northeast Student Chemistry Research Conference (NSCRC) in April 2017.

Eligibility:
Applications will be accepted from student/faculty teams at colleges and universities within the Northeastern Section. The undergraduate student must be a chemistry, biochemistry, chemical engineering, or molecular biology major in good standing, and have completed at least two full years of college-level chemistry by Summer, 2018.

Criteria for Selection:
• scientific merit - important factors include the originality of the project, the depth of the investigation, the significance of the scientific questions you pose, and the methods you propose to use.
• feasibility - evidence must be provided to demonstrate that the project can be completed by you in the time available and with the facilities at your disposal.
• preparation - your academic record, your ability to handle the project, and the background study you have made on your research problem will be taken into consideration.
• commitment - the depth of your commitment, and that of your department, faculty, and institution to independent research as a vital component of science education will be assessed.

Application for 2017:
• Announcement Letter
• Instructions
• Student Application Form
• Faculty Information Form

Completed applications are to be submitted no later than March 24, 2017, to the Chair of the Selection Committee. Please note that applications via email (PDF format) are strongly preferred.

Nominations may be made by a faculty member, or the student may submit an application. A biographical sketch, transcript of graduate and undergraduate grades, a description of present research activity and three references must be included, one of which must be from the student’s research advisor. The nomination should be specific concerning the contribution the student has made to the research and publications (if any) with multiple authors.

The award of $750.00 and a congratulatory citation will be presented at the May 2017 NESACS meeting.

Prof. Neil M. Donahue, Lord Professor of Chemistry; Departments of Chemistry, Chemical Engineering, and Engineering and Public Policy and Director of the Steimbrener Institute for Environmental Education and Research will receive the 2017 Esselen Award for Chemistry in the Public Interest.

The award will be presented to Professor Donahue at the April Monthly Meeting to be held on April 27, 2017 at the Harvard Faculty Club.

The title of his talk is: Atmospheric Ozonolysis: From Collisional Energy Transfer to Particle Physics and Everything in Between

Philip Levins Memorial Prize

Nominations for the Philip L. Levins Memorial Prize for outstanding performance by a graduate student on the way to a career in chemical science should be sent to the NESACS Administrative Secretary, 12 Corcoran Rd., Burlington MA 01803 by March 24, 2017.

The graduate student’s research should be in the area of organic analytical chemistry and may include other areas of organic analytical chemistry such as environmental analysis, biochemical analysis, or polymer analysis. Research emphasis must be on novel uses of analytical methods, not routine analysis.

Nominations may be made by a faculty member, or the student may submit an application. A biographical sketch, transcript of graduate and undergraduate grades, a description of present research activity and three references must be included, one of which must be from the student’s research advisor. The nomination should be specific concerning the contribution the student has made to the research and publications (if any) with multiple authors.

The award of $750.00 and a congratulatory citation will be presented at the May 2017 NESACS meeting.

Applicants will be notified of the results by email by April 21, 2017, with written confirmation to follow.

Selection Committee Chair:
Professor Jonathan Rochford
Department of Chemistry
University of Massachusetts Boston
100 Morrissey Boulevard
Boston, MA 02125-3393
Email: jonathan.rochford@umb.edu
Cynthia Friend, David Walt to Receive ACS Awards

Cynthia M. Friend, T.W. Richards Professor of Chemistry at Harvard University, and David R. Walt, Howard Hughes Medical Institute Professor at Tufts University, will receive 2017 ACS Awards on Tuesday, April 4, 2017, at the ACS national meeting in San Francisco, according to the announcement in the January 2nd issue of C&EN.

Cynthia M. Friend

Professor Friend is the winner of the ACS Award in Surface Chemistry, sponsored by the ACS Division of Colloid & Surface Chemistry, for her “paradigmatic developments in the mechanistic understanding of oxygen-assisted catalytic cycles on gold surfaces and their implementation to nanoporous gold catalysts under realistic conditions.” A colleague from the University of Washington said about her work, “Professor Friend has distinguished herself by innovative surface science research, plus exemplary leadership in, service to, and teaching of this field.”

David R. Walt

Professor Walt will receive the Kathryn C. Hach Award for Entrepreneurial Success, sponsored by the Kathryn C. Hach Award Fund, for “inventing and commercializing microwell arrays that benefit research, medicine, and agriculture with tremendous impact on the economy through job and value creation.” He cites George Whitesides of Harvard University, who was his postdoctoral mentor, as “a stalwart supporter and friend for over three decades,” from whom he learned how to look outside of his narrow field for interesting and important problems.
STEM Journey IV: NASA’s Mission to Mars

Free Admission

Saturday March 4, 2017
Sandwich High School/STEM Academy
Noon to 4 PM

Introduction by
Dr. Peter Dorhout,
President Elect, American Chemical Society

Keynote Speaker:
Dr. Luke Roberson, Senior Scientist
NASA, Cape Canaveral
Preregister at fb.me/stemjourney

Presented by:
* Cape and Islands Council of the Boy Scouts of America
* Northeastern Section of the American Chemical Society
* Sandwich High School/STEM Academy
* PID Analyzers, LLC
STEM Journey III – Transportation: Air, Land and Sea

By Jack Driscoll and Jennifer Maclachlan. Edited for The Nucleus by Michael Filosa

STEM Journey III was held on April 2, 2016 at Cape Cod Community College. The event was attended by 1400 enthusiastic participants which was up 27% from Stem Journey II. The number of exhibitors was up from 30 to 47 and 70 Boy Scout Merit Badges were earned.

The theme was transportation. Transportation was then divided into three sections: Land, Sea and Air.

Land:

The Land Section keynote speaker was, Dr. John J. Leonard, Samuel C. Collins Professor of Mechanical and Ocean Engineering and Associate Department Head for Research at the Massachusetts Institute of Technology. He is also a member of the MIT Computer Science and Artificial Intelligence Laboratory (CSAIL). Prof. Leonard’s research addresses the problems of navigation and mapping for autonomous mobile robots. His talk was entitled “Autonomous Cars.”

He holds the degrees of B.S.E.E. in Electrical Engineering and Science from the University of Pennsylvania (1987) and D.Phil. in Engineering Science from the University of Oxford (1994). Prof. Leonard joined the MIT faculty in 1996, after five years as a Post-Doctoral Fellow and Research Scientist in the MIT Sea Grant Autonomous Underwater Vehicle (AUV) Laboratory.

He was team leader for MIT’s DARPA Urban Challenge team (robotic vehicles), which was one of six teams to complete the race. He served as Co-Director of the Ford-MIT Alliance from 2009 to 2013. He is the recipient of an NSF Career Award (1998) and the King-Sun Fu Memorial Best Transactions on Robotics Paper Award (2006). He is an IEEE Fellow (2014). He teaches a course on Autonomous Cars at MIT.

Air:

The Air Section keynote speaker was, Daniel A. Wolf, Massachusetts State Senator and founder of Cape Air. He talk was titled “Advances in Aviation.”

Daniel Wolf founded Cape Air in 1989 with one route between Boston and Provincetown, eight employees and a first year total of 8,000 passengers.

Today, Cape Air, along with sister airliner Nantucket Airlines, is the largest commuter airline in the United States. Cape Air/Nantucket Airlines’ fleet of Cessna 402s, Cessna Caravan Amphibians, Britten-Norman Islanders and ATR-42s fly to some of the most beautiful destinations in the world. Cape Air/Nantucket Airlines is partly an employee-owned company with a workforce of approximately 1,200 serving more than 686,000 passengers a year.

Dan received a bachelor’s degree in Political Philosophy from Wesleyan University in Middletown, Connecticut and a degree at the Quaker City School of Aeronautics in Airframe and Power Plant Maintenance. Dan continues to stay current with his Air Transport Pilot license and flies as a pilot for Cape Air on weekends during the busy summer season.

In November 2010, 2012 and 2014, Dan was elected to the Massachusetts State Senate representing Cape Cod and the Islands.

Dan serves on a number of boards including the Regional Airline Association, the Cape Cod Business Round Table, the Association for the Preservation of Cape Cod. Under Dan’s leadership Cape Air has received recognition for being one of the most philanthropic companies in southeastern Massachusetts. In June of 2010 Dan received an honorary doctorate degree from Daniel Webster College in Nashua, New Hampshire.

Sea:

The Sea Section keynote speaker was Kaitlyn Tradd, Research Engineer, Applied Ocean Physics and Engineering Department, Woods Hole Oceanographic Institute (WHOI). Her talk was titled “Underwater Vehicles-Human Occupied, Remotely Operated and Autonomous.”

Kaitlyn’s work at WHOI has spanned numerous endeavors: the mechanical design and structural analysis of the recent Human Occupied Vehicle (HOV) Alvin upgrade project, several scientific research cruises with Remotely Operated Vehicle (ROV) Jason II, and the Autonomous Underwater Vehicle (AUV) Sentry, and a multitude of smaller-scale engineering projects involving many of WHOI’s submersible vehicles.

She is currently working on the design of a new vertically profiling autonomous vehicle for global ocean biogeochemical mapping, while continuing work in support of the various existing underwater vehicles, helping to continued on page 12
molecular factors, catalytic processes of multichannel and multiproduct nature could be run in all three catalytic platforms to create unique end products. This is the promise of molecularly unified catalytic scheme of the future.

Acknowledgements:
Our catalysis research is supported by supported by the Director, Office of Science, Office of Basic Energy Sciences, Chemical Sciences, Geosciences and Biosciences Division of the US Department of Energy under Contract No. DE-AC02-05CH11231. The synthesis and instrumentation research is supported by the Director, Office of Science, Office of Basic Energy Sciences, Materials Sciences and Engineering Division, of the U.S. Department of Energy under Contract No. DE-AC02-05-CH11231.

References:
Adventures in Proofreading

By Donald O. Rickter

Note from the Editor: Don Rickter mentioned to me several months ago that he was busy writing a memoir. I enthusiastically encouraged him to send me excerpts for publication in the Nucleus. This piece is the first of what I hope are many submissions from Don, who has been a key contributor and resource for the Nucleus and its editors for many years.

The story began in Yolo County, CA, when I was a teen-ager. Our major newspaper, The Woodland Daily Democrat, published an annual edition honoring Mexican Independence Day, September 16. At the top of each page were displayed the crossed flags of the US and Mexico — but they were backward. According to the Flag Code, the US flag should have been on its right (the viewer’s left). I wrote to the newspaper. My letter was printed, with my nom de plume, Thaddeus Stribling, and an apology from the editor: “Our sharp-eyed reader in Davis is correct.”

When I was an undergraduate at UC-Davis, I checked punctuation and spelling for the weekly “Cal Aggie.” I was too busy in graduate school and in the Navy to do more.

Years later, while at Polaroid in Cambridge, MA, I volunteered to help with The Nucleus. Myke Simon and Arno Heyn were my mentors. Their monthly conferences included detailed grammatical points. I decided to focus on big items, like the masthead for the February (sic) issue. I caught a notice on Ms. Goodwin she immediately sent a gracious thank you note.

Richard Cohen has at least six serious errors in his fun book about Nora Ephron, She Made Me Laugh (2016). He told of Nora’s roots in “Los Angles (sic).”

My latest interaction is with a local Pulitzer Prize winning author, Megan Marshall. Her biography, Elizabeth Bishop, A Miracle for Breakfast, is due out on 7 February. I caught a notice on Meg’s website that highlighted the word Brakfast (sic). She generously sent me an autographed copy of the book in January.

My eyes automatically react to unexpected flaws. Newspapers, TV, and the web are problems because errors of content and style are too numerous to deal with. I try to read for pleasure. I am grateful for the authors and editors who dedicate themselves to preserving truth and good stuff.

© Donald Rickter 2016, 2017

Abstract

Continued from page 5

Biography

Continued from page 5

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The Nucleus March 2017
Richards Award

Continued from page 12


Looking for seminars in the Boston area? Check out the NESACS Calendar
www.nesacs.org/seminars

New Members

Invitation to attend a meeting

You are cordially invited to attend one of our upcoming Section meetings as a guest of the Section at the social hour and dinner preceding the meeting.

Please contact Anna Singer at secretary@nesacs.org (preferred), or phone/fax 781-272-1966 between the hours of 9am and 6pm.

Robertson Microlit Laboratories

Where speed and accuracy are elemental

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March 1
Prof. Xiaolin Nan (Oregon Health and Science University)
“Biological imaging at the nanometer and single-molecule scale: spatial systems biology and cancer biome".
Northeastern, 129 Hurtig Hall
12:00 pm
Prof. Richard Anderson (Wisconsin)
WPI, Gateway Park 1002
12:00 pm

March 6
Prof. Sharon Hammes-Schiffer (Univ. Illinois - Urbana-Champaign)
Brandeis, Gerstenzang 121
4:00 pm
Prof. Lihong Wang (Washington University - Saint Louis)
Harvard, Pfizer Lecture Hall
1:50 pm

March 7
Prof. Charles Schmuttenmaer (Yale)
Univ. New Hampshire, Parsons N104
11:10 am
Prof. Jeremy Klosterman (Bowling Green)
Tufts, Pearson, Rm. P106
4:30 pm

March 8
Prof. Robert Cava (Harvard University/MIT)
Harvard, Pfizer Lecture Hall
4:15 pm

March 9
Dr. Ke Chen (Bristol-Myers Squibb) & Prof. Jared Lewis (Chicago)
Harvard, Pfizer Lecture Hall
4:15 pm

March 10
Prof. Anne McNeil (Michigan)
Brandeis University, TBA
4:00 pm
Prof. Jean-Sabin McEwen (Washington State)
Tufts, Pearson, Rm. P106
4:30 pm
Prof. Li Deng (Brandeis)
Boston College, Merkert 130
4:00 pm

March 15
Prof. Xuefei Huang (Michigan State)
“Chemistry and biology of carbohydrates.”
Northeastern, 129 Hurtig Hall
12:00 pm

March 16
Prof. M. G. Finn (Georgia Tech)
MIT, Room 6-120
4:00 pm

March 17
Prof. M. G. Finn (Georgia Tech)
MIT, Room 6-120
4:00 pm

March 20
Prof. Ramesh Giri (New Mexico)
Boston University, Metcalf, Rm 113
4:30 pm
Prof. Randall Goldsmith (Wisconsin-Madison)
Harvard, Pfizer Lecture Hall
4:15 pm

March 21
Prof. Ramesh Giri (New Mexico)
Brandeis, TBA
4:00 pm
Prof. John Wood (Baylor)
Univ. New Hampshire, Parsons N104
11:10 am
Prof. Randall Goldsmith (Wisconsin-Madison)
MIT, Room 6-120
4:30 pm
Prof. Kevan Shokat (University of California, San Francisco)
“Chemical Tricks for Drugging the Undruggable.”
Boston College, Merkert 127
4:00 pm

March 22
Prof. Kevan Shokat (University of California, San Francisco)
“Chemical Approaches for Deciphering Kinase Signaling Networks.”
Boston College, Merkert 127
4:00 pm
Dr. Amy Cannon (Beyond Benign Foundation)
“Green chemistry education and research of safer green chemistry alternative technologies.”
Northeastern, 129 Hurtig Hall
12:00 pm

March 23
Prof. Kevan Shokat (University of California, San Francisco)
“Drugs Targeting K-Ras in Cancer.”
Boston College, Merkert 127
4:00 pm

March 27
Prof. Garnet Chan (Princeton)
MIT, Room 6-120
4:30 pm

March 28
Prof. Marilyn Stains (Nebraska)
Univ. New Hampshire, Parsons N104
11:10 am
Prof. Philip Dawson (Scripps)
Tufts, Pearson, Rm. P106
4:30 pm
Prof. A.J. Boydston (Washington)
Boston College, Merkert 130
4:00 pm

March 29
Prof. Shana Sturla (ETH-Zurich)
“Toxicological investigations of how dietary components impact cancer incidence and treatment.”
Northeastern, 129 Hurtig Hall
12:00 pm
Prof. Erwin London (Stony Brook)
WPI, Gateway Park 1002
12:00 pm

March 30
Prof. Gregory C. Fu (Caltech)
MIT, Room 6-120
4:00 pm

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